ENGLISH

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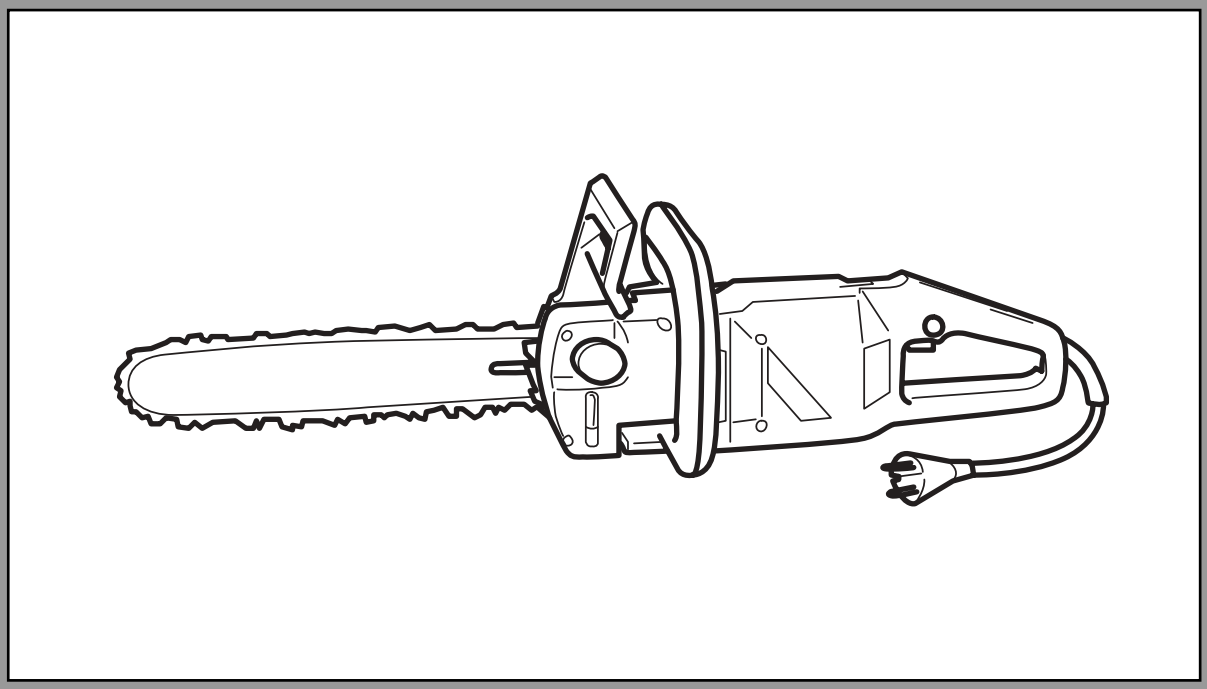


2116 EL

Operator's manual
English: page 1-34

Manuel d'utilisation
Français: page 35-68

108 87 95-95

Before using your new electric chain saw

ENGLISH

- **Read the Operator's Manual carefully.**
- Check the assembly and adjustment of the cutting equipment.
- This electric chain saw is designed for use with a 120V AC power supply. Always pull out the plug before fitting any parts or adjusting the saw.
- Do not start sawing until a sufficient amount of chain oil has reached the chain.

Index

Safety Precautions.....4-6
General safety..... 7
Introduction..... 8-10
User Explanation.....11
Technical specification..... 11
Mounting guide bar and chain.....12
Chain oil..... 12
Before each use..... 13
Start and stop.....13
Chain brake..... 14
Testing and maintenance of the chain brake..... 15
Maintenance.....16
Cutting equipment..... 17
Chain maintenance..... 18-19
General working instruction..... 20-25
Basic working techniques.....26-35

Safety symbols

The following safety symbols are found throughout this manual and are designed to make you aware of potential hazards or unsafe practices.

WARNING!

WARNING - Hazards or unsafe practices which could result in severe personal injury or death.

CAUTION!

CAUTION - Hazards or unsafe practices which could result in minor personal injury.

IMPORTANT!

IMPORTANT - Hazards or unsafe practices which could result in product or property damage.

Explanation of Symbols

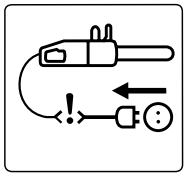
WARNING! An electric chain saw can be dangerous! Careless or improper use can cause serious or even fatal injury.

WARNING! When using an electric chain saw, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury, including the following.

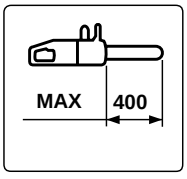
Read All Instuctions
Read and understand the Operator's Manual before using the electric chainsaw.

Always wear:
- hard hat
- hearing protection
- face protector or goggles

Do not expose to rain or damp.

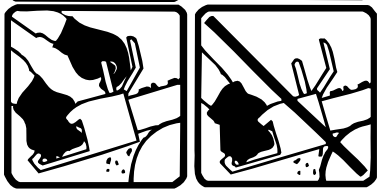


Unplug immediately if cable is damaged.



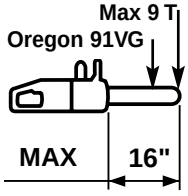
Maximum permissible bar length.

WARNING! Do not let guide bar tip come into contact with any object. Tip contact may cause kickback and serious injury.



Always use both hands when operating an electric chain saw.

Measured maximum kickback value without triggering brake, for the bar and chain combination on the label.



Recommended cutting equipment in this example:
- Bar length: 16 inches
- Max. nose radius: 9 teeth
- Chain type: Oregon 91VG

Safety Precautions

Safety precautions for electric chain saw users

Kickback safety precautions

WARNING!

KICKBACK may occur when the nose or tip of the guide bar touches an object, or when the wood closes in and pinches the saw chain in the cut.

- Tip contact can, in some cases, cause a lightning fast reverse REACTION, kicking the guide bar up and back towards the operator.
- Pinching the chain along the top of the guide bar may push the guide bar rapidly back towards the operator.
- Either of these reactions may cause the operator to lose control of the saw, resulting in serious personal injury.

Do not rely exclusively on the safety devices built into your saw. As a user of an electric chain saw, you should take a few steps to keep your cutting jobs free from accident or injury.

1. With a basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents.
2. Keep a good firm grip on the saw with both hands, the right hand on the rear handle and the left hand on the front handle, as long as motor is running. Use a firm grip with thumbs and fingers encircling the handles of the electric chain saw. A firm grip will help you reduce kickback and maintain control of the saw. Don't let go of a running chain saw!
3. Ensure that the area in which you are cutting is free from obstacles. Do not let the tip of the guide bar come in contact with logs, branches, or any other objects while the chain is running.
4. Cut at high motor speed.
5. Do not overreach or cut above shoulder height.
6. Follow chain manufacturer's sharpening and maintenance instructions.
7. Use only replacement bars and chains specified by the manufacturer, or the equivalent.

Kickback safety features

1. Reduced-Kickback Guide Bar, designed with a small radius tip which reduces the size of the kickback zone.
   A Reduced Kickback Guide Bar is a bar which has been demonstrated to significantly reduce the force and incidence of kickback when tested in accordance with UL 1662, Safety Standards for Electric Chain Saws.
2. Low-Kickback Chain designed with a contoured depth gauge and guard link which deflect the kickback force and allow wood to gradually ride into the cutter. Low-Kickback Saw Chain is chain which has met the kickback performance requirements of ANSI B 175.1.
3. Hand guard designed to reduce the chance of your left hand coming into contact with the chain if it slips off the front handle.
4. The relative position of front and rear handles is designed to provides better control, balance, and resistance to kickback
5. Chain brake designed to stop the chain if activated while chain is running.

WARNING!

Do not mount any bow guide on the electric chain saw. Any electric chain saw equipped with a bow guide is potentially very dangerous. This electric chain saw is not designed for use with a bow guide. The use of a bow guide on an electric chain saw is more hazardous because of the potential for the bow guide to come into contact with the cable, causing loss of control and the likelihood of electric shock.

To contribute to safe operation, your electric chain saw is equipped with the following important safety devices:

- Chain brake
- Power trigger lockout
- Rear hand guard
- Chain catcher

Do not operate your chain saw unless all these safety devices are properly installed and functioning. Operating your saw without these safety features increases the risk of injury to yourself and to others.

Do not use any other combination of chain and guide bar which is not equivalent to the original equipment. Failure to follow these instructions may result in serious injury.

A worn or damaged chain og guide bar may break and cause serious injury or death. Replace entire chain if it is damaged or broken.

Sharpen and maintain chain according to manufacturer's instructions. An incorrectly sharpened chain increases the chain's tendency to kick back.

Safety Precautions

Other Safety Precautions

WARNING!

Do not operate an electric chain saw with one hand! Doing so may result in serious injury to the operator, helpers or onlookers. An electric chain saw is intended for two-handed operation.

1. Stay alert. Watch what you are doing. Use common sense. Do not operate chain saw when you are tired. Keep all parts of the body away from the saw chain when motor is running. Before starting the saw, ensure that the saw chain is not touching anything.
2. Dress properly. Do not wear loose clothing or jewelry. They can get caught in moving parts. Rubber gloves and non-skid footwear are recommended when working outdoors. Wearprotective hair covering to contain long hair. Use safety goggles, safety footwear, snug-fitting clothing, protective gloves, hearing protection and head protection .
3. Do not allow other persons to be close to the chain saw when cutting or when chain is in motion. Keep bystanders, children and animals ou of the work area. Do not let unauthorized persons handle chain saw or extension cord.
4. Do not start cutting until you have a clear work area, secure footing, and a planned retreat from the falling tree.
5. Avoid body contact with the chain any time the saw is plugged into a power source.
6. Before starting the motor, ensure that the chain is not in contact with anything.
7. Carry the chain saw with the motor stopped, the finger **OFF** the power trigger, and the guide bar to the rear and away from yourself.
8. Do not operate an electric chain saw that is damaged or not completely and securely assembled.
9. Release the power trigger and make sure the chain is stopped before setting the chain saw down.
10. Use extreme caution when cutting brush and saplings. Slender material may catch the chain and whip toward you or pull you off balance.
11. When cutting a limb under tension, be alert for a sudden springback when the branch parts.
12. Keep the handles dry, clean and free of oil.
13. Give some thought to the environment of the work area. Keep work area well lit. Do not expose your electric chain saw to rain. Do not use this or any other electric power tool in damp or wet locations. Don't use electric power tools in close proximity to flammable liquids or gases.
14. Do not operate chain saw in a tree unless you have received specialized training.
15. Do not operate chain saw above shoulder height.
16. When transporting your electric chain saw, use the appropriate guide bar scabbard.
17. Cut wood only. Do not cut metal, plastics, masonry, non-wood building materials, etc. Do not use your saw to pry or shove away limbs, roots, or other objects.
18. Do not force the saw through a cut. Exert light pressure only. Pressure on the saw at the end of a cut could cause loss of control when the cut is completed.
19. Unplug the power connection when the saw is not in use.
20. Do not make any adjustment to your electric chain saw without disconnecting the power supply. Also disconnect power cable when saw is being carried any distance or is not in use.
21. Connect electric chain saw to AC power supply of the correct voltage. Ensure that power supply rating conforms to the specifications on the nameplate of the tool.
22. Make sure your extension cord is in good condition. The cable should be of an approved outdoor type and should be heavy enough to carry the current your tool will draw. An undersized cable will cause voltage drop, power loss and overheating. The wire gauge should not be less than 14 AWG / 2 x 2.0 mm². A ground fault protector is recommended.
23. Keep the cable clear of the chain and operator at all times. **NEVER** carry the electric chain saw by its power cable.
24. **Defective power trigger and/or power trigger lockout. DO NOT** use the chain saw if these parts are defective and do not turn the chain saw **ON**. **Contact your Authorized Service Dealer.**
25. Unplug saw before servicing or changing accessories.
26. Your electric chain saw is double-insulated to help protect against electric shock.
27. Have all service on your electric chain saw (other than the operations described in the maintenance section of this manual) performed by an Authorized Service Dealer.
28. Ensure that all hand tools are removed fromthe saw before connecting the saw to the power supply.
29. Store the saw unplugged in a dry place out of reach of children and with the appropriate guide bar scabbard mounted.
30. When servicing, always use Husqvarna original spare parts.
31. Maintain chain saw with care. Keep tools sharp and clean for better and safer performance.

Safety Precautions for Electric Tools

Double insulation

1. Your electric chain saw is double-insulated for enhanced protection against electric shock.
   A double-insulated tool is designed with two separate«layers» of electrical insulation, or one double thickness of insulation between the operator and the tool's conducting parts.
   Tools that are double-insulated do not use a grounded (three-pronged) plug. You can plug your saw into any conventional 120 Volt electrical outlet.
   We recommend using a ground fault protector as an extra safety measure whenever you use your electric chain saw or any similar power tool.
3. Safety precautions must be observed when operating any electric tool. Double insulation provides added protection only against the result of an electrical insulation failure inside the saw.

Power supply and extention cable

1. Power supply.
   Use only an AC voltage supply conforming to the specification on the name plate of the saw.

WARNING!

All electrical repairs to this saw, including housing, trigger, motor, etc., must be diagnosed and performed by an Authorized Service Dealer. Operations performed by untrained persons may lead to the failure of the double insulation and result in serious injury.

2. Extension cable.
   The extension cable used to reach the power source must be :
   Specifically marked as suitable for outdoor use.
   The W-A marking must be visible on the cable.
   Heavy enough (see table) **to carry the current the full length of the cable.**
   If this conditions is not observed, loss of power and overheating may damage the cable and the saw.

Length of cable (ft.)	25	50
Wire gauge	14	14

Cable longer then 50 feet in length is not recommended.

In good condition. Cord insulation must be intact, with no cracks or deterioration. Plug connectors must be undamaged.

3. Important considerations.

a) **Secure the tool cable to the extention cord** by making a knot to prevent disconnection.

b) **Do not abuse cables.** Never carry the saw by the power cable or disconnect it by yanking on the cable. Keep tool cable and extention cord away from heat, oil, and sharp edges.

c) **Avoid entanglement.** Keep cables clear of operator, saw chain, and branches at all times.

d) **Inspect electric chain saw and extention cables before each use.** Do not use a unit with a damaged cable. Take the unit to your Authorized Service Dealer for repairs.

e) **Guard against electric shock.** Avoid body contact with any grounded conductor, such as metal pipes or wire fences.

f) **Examine the work area.** Keep work area well lit.
Do not expose an electric chain saw to rain.
Do not use this or any other electric power tool in damp or wet locations. Do not use electric power tools near flammable liquids or gasses.

⚠ CAUTION!

Vibrations from the prolonged use of hand tools may cause damage to blood vessel or nerves in the fingers, hands, and wrists of people prone to circulation disorders or abnormal swellings.
Prolonged use in cold weather has been linked to blood vessel damage in otherwise healthy people.
If symptoms occur such as numbness, pain, loss of strength, change in skin color or texture, or loss of feeling in the fingers, hands or wrists, discontinue the use of this tool and seek medical attention.
Users who operate power tools on a continual and regular basis must keep a close eye on their physical condition and the condition of the tool.

If you experience any discomfort in your fingers, hands, wrists or arms, you should discontinue any work with ALL VIBRATING TOOLS and see your doctor for medical advice.

⚠ CAUTION!

To reduce the risk of electric shock, this equipment has a polarized plug (one blade is wider than the other). This plug will fit only one way in a polarized outlet. If the plug does not fit properly in the outlet, reverse the plug. If it still does not fit, contact a qualified electrican to install the proper outlet.
Do not change the plug in any way.

SAVE THESE INSTRUCTIONS

General Safety

General Safety Precautions

WARNING!

An electric chain saw is designed to cut wood, and can be dangerous. Careless or improper use can cause serious or even fatal injury.

It is important that you fully understand the contents of this manual, and that you allow only competent adults who understand the instructions in this manual to operate your electric chain saw. It is your responsibility to make sure that any people who use your electric chain saw have read and understood this manual.

WARNING!

Safety is your responsibility. Read and understand this manual before operating your electric chain saw. If you have any questions, see your dealer.

WARNING!

Do not modify the equipment for any reason. Altering the electric chain saw can result in operator injury or equipment failure.

WARNING!

Never use equipment that is not functioning properly. If your electric chain saw is not working properly, have the saw repaired by qualified service personnel.

WARNING!

Wear safety equipment when working. Never wear loose clothing or jewelry that could get caught in moving parts.

CAUTION!

Perform safety check before starting each day.

CAUTION!

Know the requirements of each job and the terrain before using an electric chain saw.

WARNING!

When using a chain saw, basic safety precaution should always be followed to reduce the risk of fire, electric shock and personal injury.

Electric Chain Saw Operator

This manual is primarily intended for the casual or occasional operator. These instructions are basic. It is not possible to cover every situation you may encounter while using your electric chain saw. Be careful at all times and avoid situations that may be too complicated for your experience. If you are unsure of a cutting situation, call a logging expert before continuing. We encourage you to seek instruction on the use of electric chain saw. Your dealer, forestry school or library can tell you what instructional material and training courses are available. The better prepared you are, the better and safer operation you will get from your electric chain saw.

Common Sense

Your electric chain saw can be a very dangerous tool if improperly or carelessly used or if improperly equipped or maintained. The following instructions are basic and cannot cover all situations you might encounter while using your electric chain saw. Use common sense and caution at all times. Avoid situations that may be too dangerous or complicated for you. If you still feel you do not understand the dangers of using an electric chain saw after having read this instructions, you should not use the saw. Seek personal instruction from people qualified to instruct you on the use of electric chain saws. Your dealer can tell about training provided by local forestry schools. Should you have more questions about the use of your saw, don't hesitate to contact your dealer or us. We will be more than happy to provide you with any advice that will help you to use your saw in a better and safer way. New designs and techniques are introduced continously - designs that will increase your safety and productivity. Make a point of stopping by your service dealer to see how the latest designs can benefit you. It will be worth it. Safe cutting.

Introduction

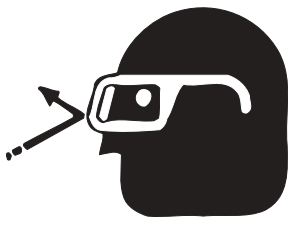
Your electric chain saw comes with an Operator's Manual containing general information on how to safely operate your electric chain saw. It also provides specific information on your particular model.
Read the Operator's Manual very carefully before operating the electric chain saw.
We work continually to improve our products, and engineering changes and improvements are introduced from time to time. Written notices describing these changes are sent to our dealers. Make a point of asking your dealer to show you the latest design.

WARNING!
Under no conditions should the electric chain saw be modified from its original design without the approval of the manufacturer. Nonauthorized accessories should never be used. Nonauthorized modification and/or accessories can lead to serious injury or death to the operator or to others.

⚠ CAUTION!
The noise produced by a chain saw is loud enough to cause permanent hearing impairment after long or continous periods of exposure.
Always wear hearing protection when operating a chain saw.

Thrown Objects

When the motor is running at cutting speed, the saw chain runs at approximately 30 - 35 mph (14 m/s).
It is capable of throwing objects such as chips and small pieces of wood with considerable force, and can cause injury, especially to the eyes.



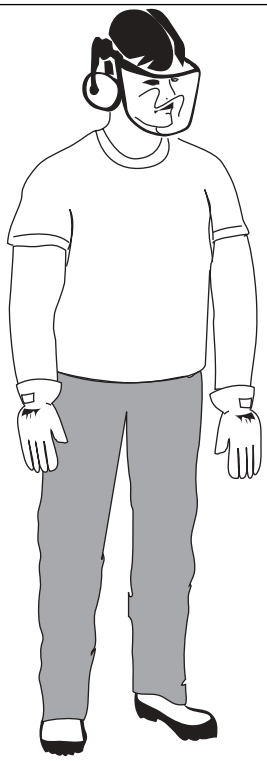
⚠ CAUTION!
Always wear safety goggles or a face shield to minimize the risk of injury from thrown objects

Personal Equipment

Your condition

Never operate an electric chain saw when you are tired, angry, emotionally upset or under the influence of alcohol, drugs, medications or anyting which could affect your vision, alertness, coordination or judgement. Cutting wood can be strenuous - check with your doctor before undertaking this kind of work.

Clothing



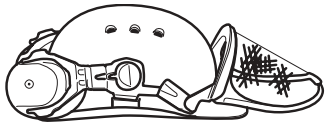
Proper clothing and equipment (as shown) protect you from potensial hazards such as lacerations, thrown objects and hearing impairment.
Always wear:

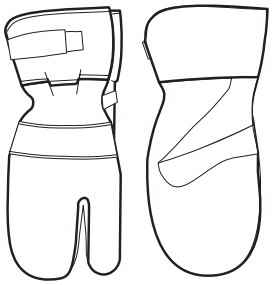
- hearing protection
- goggles or face shield
- non-slip gloves
- safety pants or chaps
- boots with steel toecaps and non-skid soles

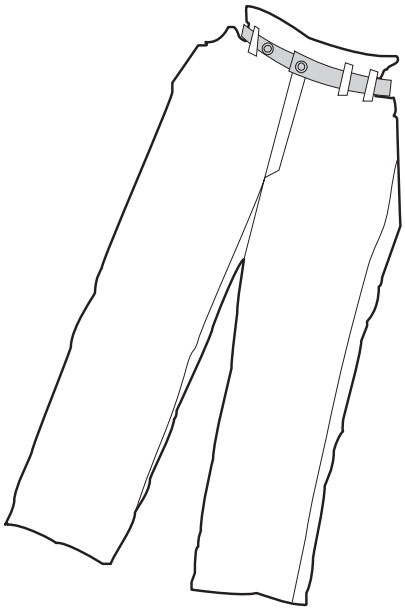
IMPORTANT!
Personal safety equipment will not prevent all accidents, but it may minimize injury in the event of accident. For your own protection, ask your dealer to show you the latest safety equipment available, such as a hard-hat with face shield end ear protectors, and safety pants or chaps.

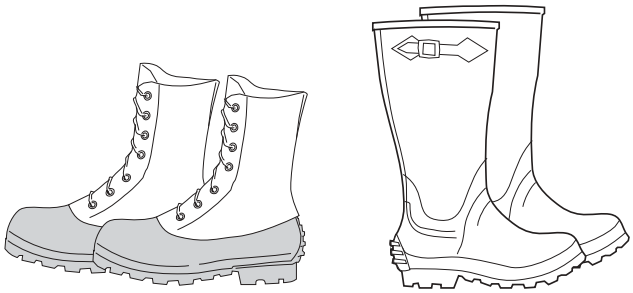
Never wear loose-fitting clothing, jewelery, etc., which could catch on the saw and cause serious injury.
Wear protective hair covering to contain long hair.

Introduction









IMPORTANT!

We strongly recommend the use of this safety equipment by all users at all times.
Because safety records demonstrate a clear decrease in the rate of injury when safety equipment is used, most professional logging operations now require their operators to wear these items. Take advantage of their experience. Your dealer will gladly assist in finding the right safety equipment for you.

Complete Protective Helmet

This consists of a lightweight hard-hat with ear-muffs and face shield attached. The main advantage is that everything you need is in one piece of equipment rather than three. Ear-muffs attached to the hard-hat also help keep it securely on your head.
The hard-hat is intended to reduce the risk of injuries from objects that may fall from a tree. Ear-muffs reduce the risk of hearing impairment from operating noisy equipment over a prolonged period of time. The face shield protects the face from small branches and the eyes from flying dust and chips.

Heavy Duty Gloves

Special gloves are available with the left glove reinforced to minimize injuries from accidental contact with a running chain saw.

Protective Pants or Chaps

The material used in modern protective pants consists of several layers of tough syntetic fabric which reduce the likelihood of injury in the event of contact with a running chain saw.

Boots

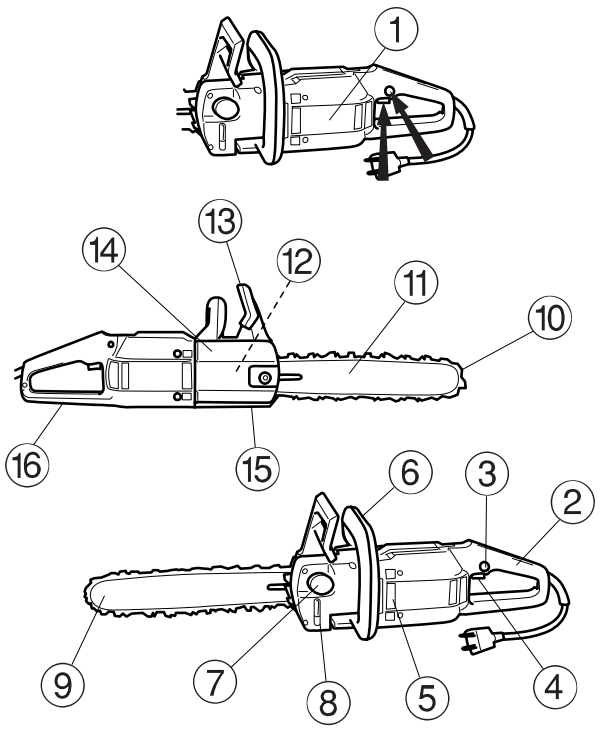
Special work boots with reinforced front and upper sides are available for loggers. Should you inadvertently hit the boot with the saw, these protective boots may protect you from injury.

First Aid Kit

A first aid kit approved by the Red Cross or similar organization should always be carried in case of injury in the field.

A kit should contain large dressings for lacerations, splints and slings for fractures, antiseptic and other optional items for your safety and convenience, such as insect repellent or a snake bite kit.

User Explanation



1. Chain Saw Powerhead
2. Rear handle
3. Power trigger lockout
4. Power trigger
5. Air vents
6. Front support handle
7. Chain oil tank
8. Oil level window
9. Nose sprocket
10. Saw chain
11. Guide bar
12. Chain brake - which is obscured by the clutch cover
13. Front hand guard. Lever for chain brake
14. Clutch cover
15. Chain catcher - designed to catch the chain if the chain jumps or breaks
16. Chain guard - designed to protect the right hand in the event of the chain jumping or breaking

Technical specifications

Motor

Voltage	Volts AC	120
Rated Power	Watts	1600
Frequency	Hz	60
Rated Current	Amps	13
Overload protection		Mechanical

Weight

Without bar and chain	kg/lbs	3.7/8.2
With 14" bar and chain	kg/lbs	4.5/9.9

Chain lubrication

Oil tank capacity	l/US. pint	0.1/0.21
Oil pump		Automatic

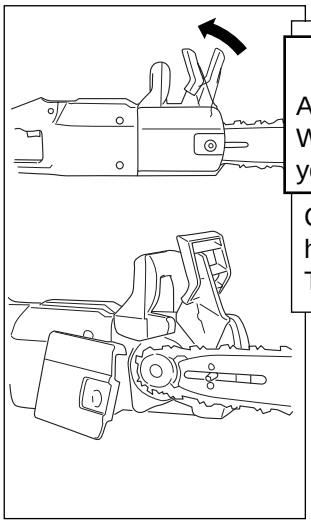
Chain/bar

Standard bar lengths	inch/cm	14/35
	inch/cm	16/40
Recommended bar lengths	Inch/cm	12/29
	inch/cm	16/40
Chain speed unloaded	m/sec	14
Chain speed at max power	m/sec	10
Chain pitch	inch	3/8"
Thickness of drive links	mm	1.3
Number of drive links	14"/16"	52/56

This saw is double insulated and manufactured in accordance with the relevant safety regulations (ANSI B 175.1 and UL 1662).

Manufacturer Electrolux Motor A/S - 1708 Sarpsborg, Norway

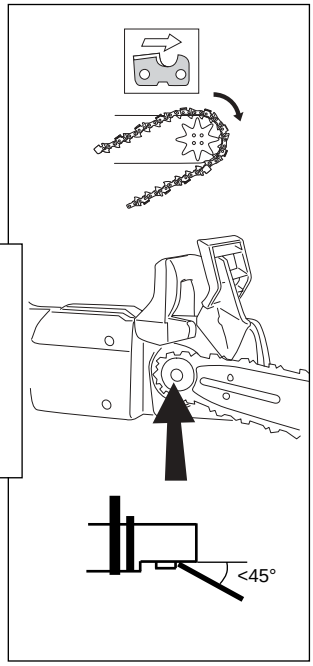
Mounting guide bar and chain



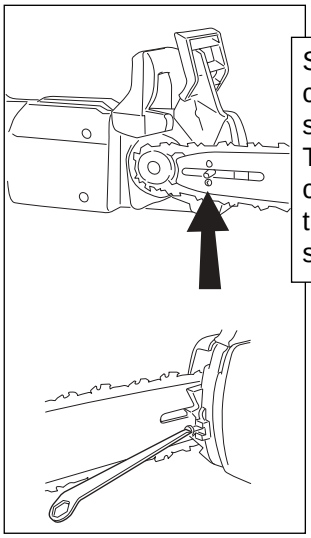
WARNING!

Always pull out the plug before fitting parts or adjusting the saw. Wear gloves when working with the chain in order to protect your hands from injury.

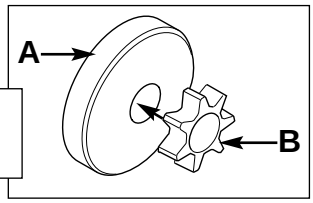
Check that the chain brake is disengaged by moving the front hand guard towards the front handle.
Take off the bar nuts and remove the clutch cover.



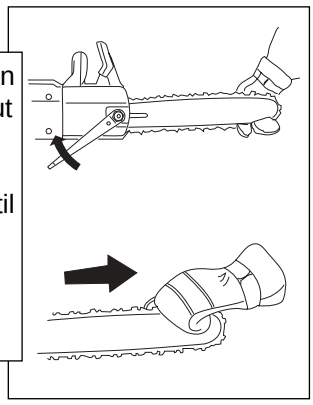
Fit the chain around guide bar nose with the top cutters facing forwards. Holding the chain over the guide bar nose, position the back end of the guide bar against the drive sprocket at a 45° angle to the power head. Pass the free end of the chain around the drive sprocket, swing the guide bar into place over the mounting bolt and against the power head, and guide the chain into the guide bar groove.



Seat the guide bar on the adjusting pin and replace the clutch cover. Check that the drive links fit correctly on the drive sprocket and that the chain is in the groove on the bar. Tighten bar nuts finger tight. Adjust chain tension, using combination wrench to turn adjustment screw clockwise to tighten. Tighten adjustment screw until the chain is drawn snugly against the underside of the bar.



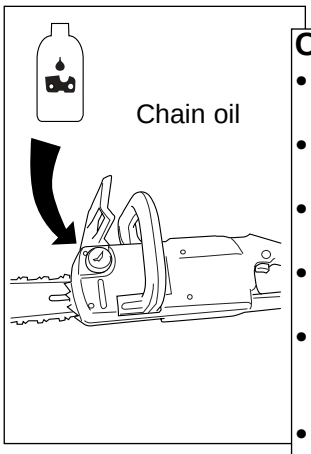
A Clutch
B Drive sprocket.



Support the tip of the bar while adjusting the chain. Chain tension is correct when there is no slack on the underside of the bar, but the chain may still be turned easily by hand. Hold up the bar tip and tighten the bar nuts with the combination wrench.
When a new chain has been fitted, check tension frequently until the chain has been broken in.

Check chain tension regularly. A chain that is correctly adjusted gives good cutting performance and lasts longer.

Chain oil



Chain oil

- The chain lubrication system is automatic.
  Always use special chain oil with good adhesive characteristics.
- In countries where no special chain oil is available,
  gear oil EP 90 may be used.
- Never use waste oil. Doing so may result in damage to the chain, bar and oil pump.
- It is important to use oil of the correct viscosity appropriate to the air temperature.
- In temperatures below 0°C (32°F) some oils become more sluggish. That puts an added strain on the oilpump and may cause damage to oil pump parts.
- Contact your service dealer for help in choosing the right chain oil.

Before each use

WARNING!

- Always disconnect power cable before fitting parts or adjusting the saw.

- Make sure the chain brake is undamaged and operating properly (see page 15).
- Check right hand-guard for damage.
- Check entire saw for loose screws and damaged or missing components. Cable insulation must be intact, with no cracks or deterioration. Plug connectors must be undamaged.
- Ensure that the power trigger and lockout are undamaged.
- Use only an AC power supply which is identical to that specified on the nameplate of the saw.
- Secure the tool cable to the extension cord by making a knot to prevent disconnection.
- Make sure the oil tank is full.
- Maintain correct chain tension.

WARNING!

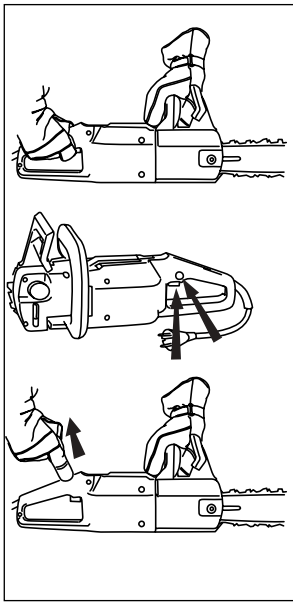
All elctrical repairs to this saw, including housing, trigger, motor, etc., must be diagnosed and performed by an Authorized Service Dealer. Operations performed by untrained persons may lead to failure of the double insulation and result in injury.

- NEVER carry the chain saw by its cable.
- Store the chain saw unplugged in a dry place out of reach of children.
- Drain the oil tank before storing your electric chain saw for 30 days or more.
- Avoid dangerous situations. An electric power tool gives off sparks that can ignite explosive substances and mixtures. DO NOT expose power tools to rain or use them in damp, wet, gaseous or explosive environments. Keep work area well lit.

Start and stop

WARNING!

- Never start the chain saw without the bar, chain and clutch cover assembled. The clutch can loosen and cause personal injury.
- Never operate an electric chain saw holding it with only one hand. Always maintain a firm, solid grip with both hands on the handles.
- Take care that the chain makes no unintended contact with anything when you squeeze the power triggger and the chain begins rotating. Make additionally sure that your footing is secure.
- Keep people and animals well away from work area.
- Make certain your extension cable is in good condition. The cable should be approved for outdoor use. When using an extension cable, ensure that it is heavy enough to carry the current your tool will draw. An undersized cable will cause a drop in line voltage, loss of power and overheating. The wire gauge should not be less than 14 AWG / 2 x 2.0 mm^2. A ground fault protector is recommended.



Starting up

Grasp the front handle with your left hand and the rear handle with your right hand. Push in the power trigger lockout using yout right thumb, and sqeeze the power trigger.

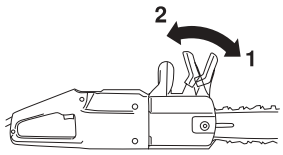
NOTE! If you are left-handed:

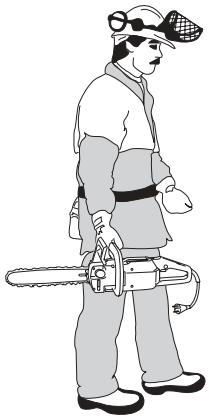
Your electric chain saw is designed to be gripped with your right hand on the rear handle and your left hand on the front handle. **ALL PEOPLE, WHETHER RIGHT OR LEFT-HANDED, SHOULD USE THIS GRIP.** Using the opposite grip - right hand / front handle, left hand / rear handle - gives you less control of the saw.
It also brings the bar and chain closer to your body during normal operation. It is also possible you will not be able to activate the chain brake if your right hand is holding the front handle.

To stop

The saw will stop when you release the power trigger.

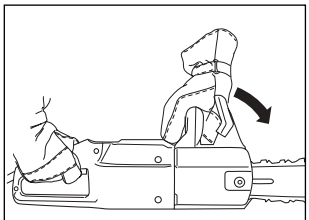
Chain Brake

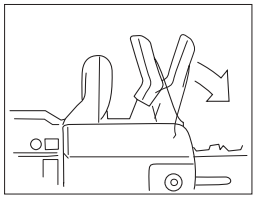


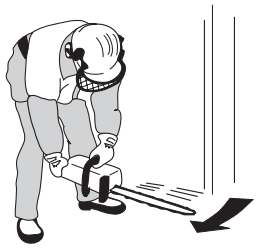


Chain brake

Your saw is equipped with a chain brake which can be activated both manually and by the force of inertia. The chain brake consists of the front hand guard, an activating mechanism, a spring and a brake band encircling the clutch drum.
When the front hand guard is moved foreward, the mechanism releases the spring, jerking the band tight around the clutch drum. When activated, the chain brake is designed to stop a rotating chain instantaneously. The chain brake is activated when the front hand guard is pushed foreward (1). If the chain brake has been activated, it is disengaged by pulling the front hand guard back towards the front handle (2). The chain brake must be disengaged when the saw is running.







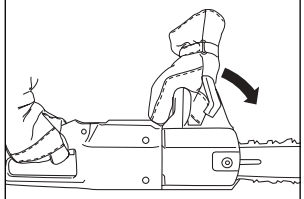
Manual activation

Move the front hand guard foreward until the chain brake «clicks on».

Inertia activation

If your chain saw is suddenly pushed rearward with sufficient force, the sudden movement can activate the chain brake. The advantage of inerta activation is that a kickback (see p. 20) can have enough force to activate the chain brake without the left hand having to touch the front hand guard.

Testing and maintenance of the chain brake

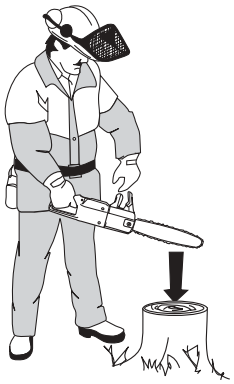


IMPORTANT!

Failure to check and maintain the chain brake may result in the failure of the chain brake to activate in the event of a kickback.

Brake function test:

The chain brake must be checked several times daily. Place the saw on firm ground. Keep a firm grip on the saw with your right hand on the rear handle and your left hand on the front handle, and with your thumbs and fingers encircling both handles squeeze the trottle. Then activate the chain brake by turning your left wrist against the hand guard without releasing your grip on the front handle. The chain should stop immediately (illustr.).



⚠ CAUTION!

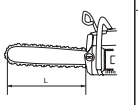
Always disconnect power cable before fitting parts or performing adjustments.

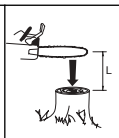
Inertia-activation function test

The chain brake must be checked several times daily. Hold the chain saw approximately 18 inches (45 cm) above a trunk or other firm wooden object. Release your grip on the front handle and let the saw fall, rotating around the rear handle. When the tip of the guide bar hits the trunk, the brake should activate.

STOP WARNING!

Dirt and wear effect brake funktion. Follow all maintenance instructions carefully. If anything about your chain brake is not in order, contact your service dealer.

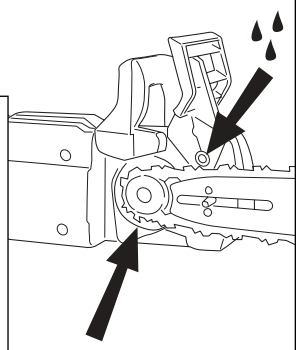




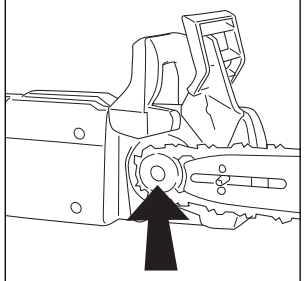
inch/cm	inch/cm
12"/30cm 14"/35cm 16"/40cm	18"/45cm 20"/50cm 22"/55cm

Maintenance:

With the motor shut off, move front hand guard back and forth to ensure that the mechanism works freely and that the brake is activated. If necessary, clean resin and chips from the brake. Lubricate the mechanism and bearing surfaces with oil. Check that the brake band is at least 0.65 mm (0.026 in) thick where most worn.



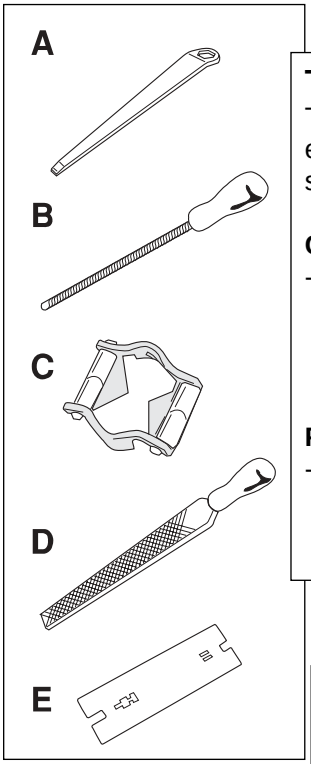
min 0.65 mm /0.026 in



Motor overload protection

The saw is equipped with a slipping clutch which protects it from overload.
If the chain stops while the motor is running, the saw is overloaded. Ease up on the cutting pressure until the chain begins to turn again. If the blade has jammed, stop the saw immediately and free the blade. If the chain stops frequently while cutting, it may be due to a dull chain. If so, stop and sharpen the chain.

Maintenance



Tools and materials

The tools and materials shown are absolutely essential for the everyday safe operation and maintenance of an electric chain saw.

Combination wrench:

- This type of wrench (A) or its equivalent should always be carried with your electric chain saw.
  The wrench is needed to adjust chain tension, which must be correctly adjusted for safer cutting.

Files:

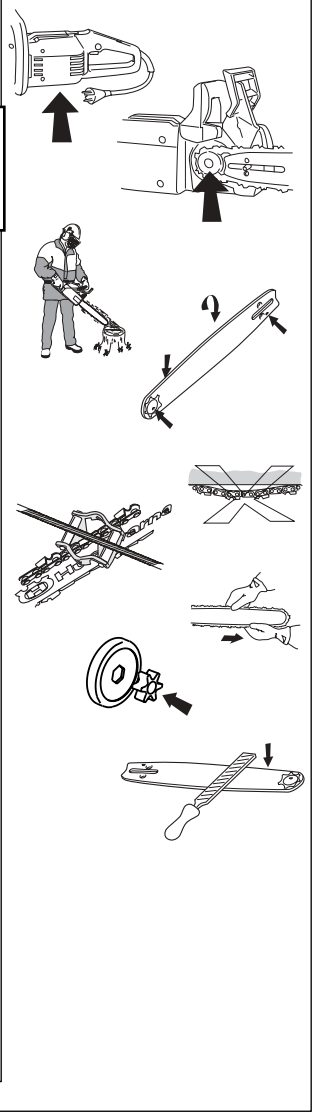
- You need one round file (B) with file gauge (C) to sharpen the cutting teeth of the chain, and one flat file (D) and depth gauge tool (E) for filing the depth gauge.

Saw maintenance

The following are some general maintenance instructions. For further information, please contact your service dealer.

WARNING!

Always disconnect power cable before fitting parts or adjusting the saw.



Daily maintenance

- Check the power supply cable and plug for damage or cracking. A worn or defective cable or plug should always be replaced.
- Clean the chain brake and check that it functions properly.
- Check that the chain catcher is in good condition and replace if necessary
- Check air intakes and clean away dust and/or chips with a dry brush if necessary.
- Check that the bar and chain are well oiled (see p. 18)
- The bar should be turned daily to ensure even wear.
  Check that the oil hole in the bar is not blocked.
  Clean the chain guide.
- Sharpen the chain and check that it is correctly tensioned and in good condition.
- Check that there is no excessive wear on the chain drive sprocket. Replace if necessary.
- File off any burrs on the sides of the bar.

Slipping clutch

It may be necessary to clean the clutch after extended use. Contact your service workshop if it is necessary to clean the clutch.

Cutting Equipment

Recommended cutting equipment

The combination of power head, bar and chain used together with this unit has been determined in accordance with the kickback requirements specified in ANSI B 175.1 - 1991.
The guide bar nose radius is determined either by the maximum number of teeth in the nose sprocket or by the corresponding maximum nose radius of a solid bar.
The following list specifies the chain saw manufacturer's recommendations. Other combinations may also provide the same kickback protection.
We have listed the maximum guide bar nose radius, but you may use a guide bar with smaller nose radius than the one we recommend. For guide bars of the same length, all sprocket-nose guide bars of the same pitch and having the same number of sprocket teeth may be considered to have equivalent kickback energy. A hard-nose bar of the same length and nose radius as a sprocket-nose bar may be considered to have equivalent or less kickback energy than the sprocket-nose bar.

Low kickback saw chain is chain which has met the kickback performance standards of ANSI B 175.1 and the saftey requirements for gasoline-powered chainsaws when tested on the representative sample of chain saws below 3.8 cu.in. specified in ANSI B 175.1 These are marked with an asterisk ***** in the table below. We recommend that you use the listed bars and chains as replacements or the low kickback chains available your dealer.
NOTE: The second digit in the Oregon part number indicates the thickness of the drive link.
You are free to choose between a 0.050" and 0.058" drive link for the corresponding bar.

OREGON 33 indicates 0.050"/1.3 mm
OREGON 34 indicates 0.058"/1.5 mm

Saw chain	Length inch	Pitch inch	Max nose radius
Oregon 91VG *	12, 14 and 16	3/8	9t

CSA Z62.3 Certified Cutting Equipment for Jonsered 2116EL Chain Saws.

Cutting equipment for class 2A Electric Chain Saws.

Following is a list of evaluated combinations for use on the Jonsered 2116 EL chain saw.
These combinations have been determined in accordance with CSA Z62.1-95 Chain Saws and Z62.3-96 Chain Saw Kickback requirements.

Computed Kickback Angle (CKA) is the angle used as a measure of the reaction of a hand-held chain saw when subjected, under simulated conditions, to a rotational kickback impulse.

The guide bar nose radius is determined either by the maximum number of teeth in the nose sprocket or the corresponding maximum nose radius of a solid bar.

As we have listed the maximum guide bar nose radius, you may use a guide bar with a smaller nose radius than the ones recommended in our list. For guide bars of the same length, all sprocket-nose guide bars of the same pitch and having the same number of sprocket teeth may be considered to have equivalent kickback energy.
A hard-nose bar having the same length and nose radius as a sprocket-nose bar may be considered to have equivalent or less kickback energy than the sprocket-nose bar.

We recommend that you use the listed bars and chains as replacements.

CKA, W/O is the CKA without a chain brake.
CKA, W is the CKA with a chain brake.

Model	Guide bar			Saw chain		
	Length inch	Pitch inch	Max nose radius	Type	CKA W/O	CKA W
316 Electric	12	3/8	9T	Oregon 91VG	17.2°	-
	14	3/8	9T	Oregon 91VG	24.7°	-
	16	3/8	9T	Oregon 91VG	25.4°	-

Other chain and bar combinations may be available which also provide kickback protection.

Chain Maintenance

Chain maintenance - safety

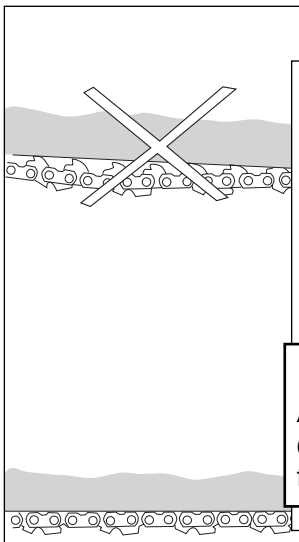
For personal safety, it is of great importance to use bar and chain combinations of the low-kickback type, and that the cutting equipment is properly maintained.

Important notes :

- Chain tension
- Sharpening
- Lubrication
- Maintenance

WARNING!

Always disconnect power supply before fitting parts or adjusting the saw.

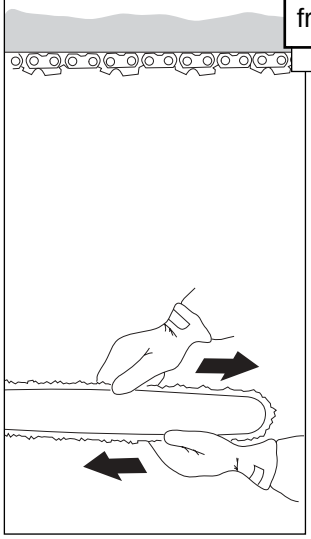


Chain tension

A loose chain may jump off the bar and cause injury.
This is also the most frequent cause of chain problems.
Loose running can also ruin a chain, bar and drive sprocket.
Chain tension should be checked frequently during work and adjusted if necessary.
Tension the chain as tight as possible allowing the chain to be pulled easily by hand.

CAUTION!

After adjusting tension, check by pulling the chain in the normal direction of rotation. Always wear gloves to protect your hands from injury.



Chain lubrication

Top up chain oil reservoir regularly. Never run the chain dry. Inadequate lubrication may cause friction, leading to cracked links. For the same reason, waste oil must not be used as chain oil. Always use a good high-adhesion chain oil which is designed to withstand the pressure involved. Clean bar groove and oil hole regularly.

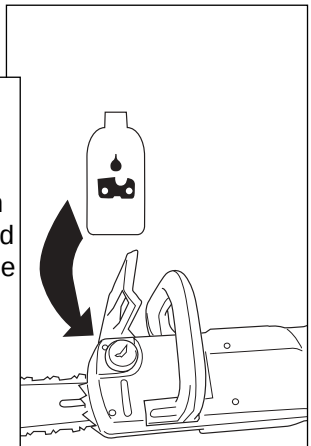
Checking the lubrication system

Point the tip of the guide bar towards a light-colored surface about 8 inches (20 cm) away. After the saw has been running for 1/2 - 1 minute there should be visible signs of oil spatter on the surface.

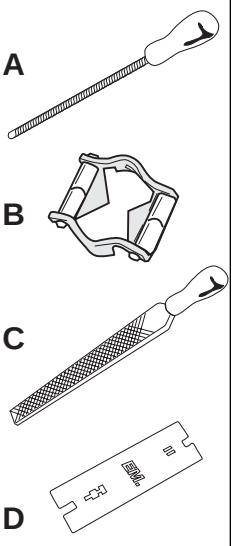
Check daily for:

- Cracking in rivets and links
- Excessive wear on side links and cutting edges, and stiffness in the chain
- A cutter should never be filed to less than 5/32 inch (4mm)
- Correct depth gauge setting

NOTE! Change drive sprocket each time a new chain is fitted.



Chain Maintenance

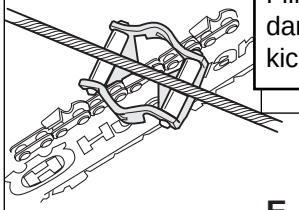


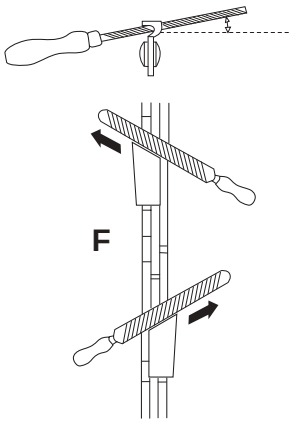
Sharpening

Never cut with a dull chain. A chain which does not cut unless you bear down hard is damaged, dull or incorrectly filed.
To file the chain correctly, you need: round file (A), file gauge (B), flat file (C) and depth gauge tool (D). Best results are obtained by using the correct file size (see table) and a file gauge with a marked filing angle.
NOTE! Check that the drive link does not show excessive play in the bar groove. This may affect the sharpening operation. Note that for some chains, the file is held level, while for others the file is held with the handle low at the angle indicated (E).
Always file from the inside of the teeth and out (F). After filing one side, turn the saw and file the other side. To insure that the saw cuts straight, all teeth should be filed to the same length min. 0.15" (4mm). If the chain is sharpened regularly, only a few strokes of the file are needed on each tooth.
To achieve maximum performance, each chain has a specific cutting angle, file size and depth.

WARNING!

Filing too deep or using a file which is too small will make a chain dangerously aggressive. This means that the chain's tendency to kick back increases and the chain becomes dangerous to use.





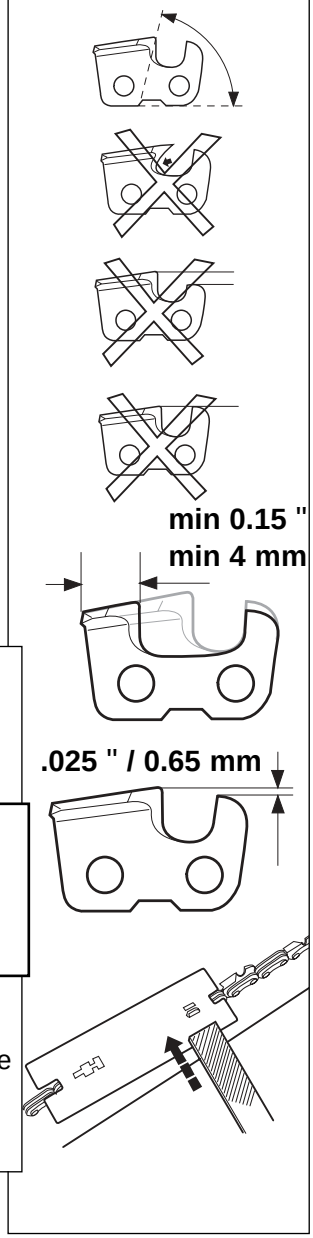
Depth gauge

To ensure the best performance and longest service life of the chain, always keep the depth gauge at the prescribed length (0.025" / 0.65 mm).

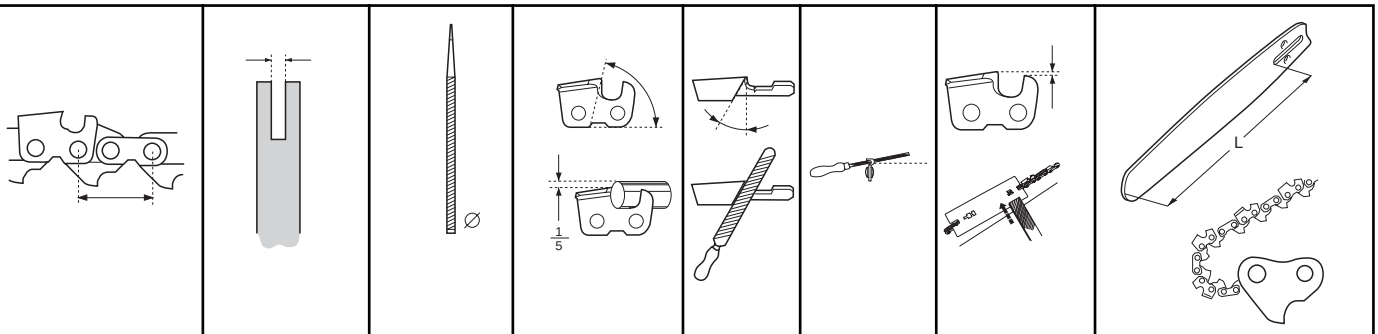
WARNING!

An excessively low depth gauge makes the chain dangerously aggressive. This means that the chain's tendency to kick back increases and the chain becomes more dangerous to use.

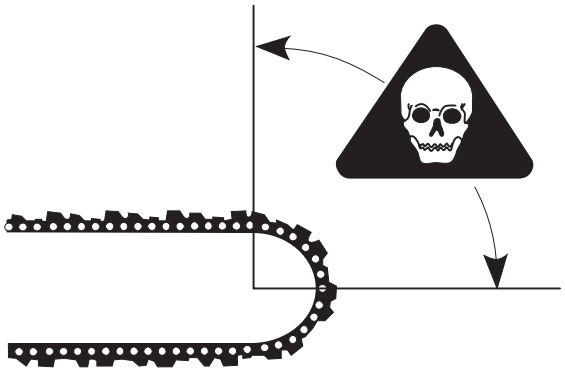
Depth gauges are checked using a depth gauge tool (for specification, see table).
NOTE! The chain should be sharpened before depth gauges are checked. Adjustment of the depth gauge is done with a flat file. Round off the corner of the depth gauge afterwards.



Bar / chain combinations approved for reduced kickback

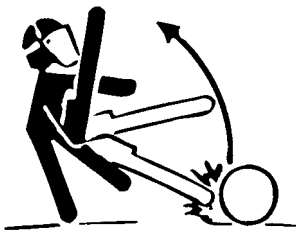


inch	inch/mm	inch/mm	°	°	°	inch/mm	inch/mm/dl
91VG 3/8"	0.050/1.3	5/32"/4.0	85°	30°	0°	0.025/0.65	12/30/48/35/52 16/40/56



What is kickback ?

WARNING!

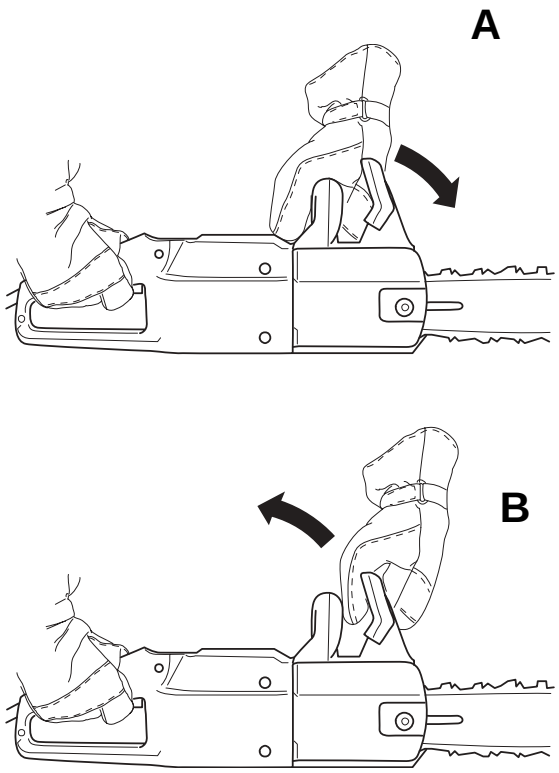


Kickback can be sudden and violent, and may throw the bar and saw chain back at you, inflicting serious or fatal injury. A good understanding of this phenomenon and how it can be avoided is a must when working with an electric saw.

Kickback is the sudden, rearward jerk of the saw that can occur if the kickback zone of the bar touches an object. Most kickbacks are small. They can cause the bar tip to jump only a few inches and pose little danger. However, a kickback can also be very powerful.
If you are not paying attention and/or have a poor grip, the saw can be thrown all the way back at you.
If the chain is still running, and it hits you, it will severely cut you.

Rotational Kickback.
Kickback can occur when the upper tip of the guide bar, the kickback zone, touches something, such as a trunk, branch or other object.
When the nose is used, only one or two cutters engage the wood at a given time. As a result, the chain might grab or jam. When the chain gets blocked and stops, the reaction will cause the guide bar to kick back.
It can be a lightning fast reverse reaction kicking the guide bar back at you.

General Working Instructions



Chain brake
One safety feature of the chain saw is the chain brake. It will not prevent a kickback, but is designed to reduce the severity of certain kickbacks. When the chain brake is triggered, a mechanism which locks the clutch drum is activated and stops the saw chain almost instantly. The mechanism can be reset by moving the hand guard back against the front handle (B).

The chain brake is triggered when the hand guard is moved forward (A). This may occur when your left hand/wrist touches the hand guard during a kickback.

Will My Hand Always Activate the Saw Chain Brake During a Kickback?
No. It takes a certain amount of force to move the handle forward. If your hand only lightly touches the front guard or slips over it, the force may not be enough to trigger the chain brake. It is important that you maintain a firm grip on the chain saw handles while working. If you do and experience a kickback, your hand might not leave the front handle to activate the chain brake or the chain brake will be activated by your wrist only after the saw has swung around a considerable distance. In such instances, it might not be enough time for the chain brake to stop the chain before it touches you.

Does a Chain Brake Work in All Situations and Positions?
No. First, the chainbrake must be properly maintained to work. Second, there are certain positions in which the chain may not activate. Third, the chain brake must be activated to stop the chain. If it is not activated, the chain will continue to run. Fourth, the chain brake might not have enough time to bring the chain to a standstill before it reaches your body if you are too close to the cutting bar due to improper working technique.

⚠ CAUTION!

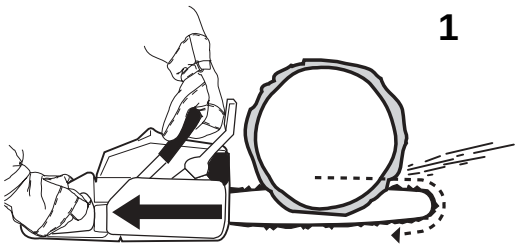
A chain brake may not always activate during a kickback. A chain brake can provide its intended protection only if it is properly maintained.
A neglected and abused chain brake might not work when you need it most. Test the chain brake periodically to be sure it will work for you if you have a kickback.
We recommend that you test the chain brake after each work breake. If the chain brake does not activate, clean it and check that the mechanism is not damaged. If the chain brake still does not work, take your chain saw to your service dealer for repair.

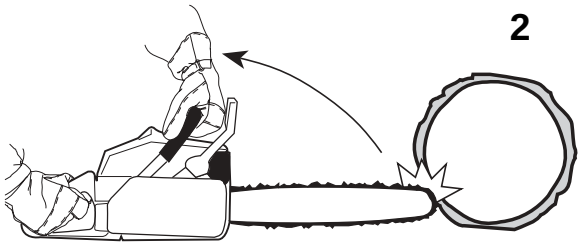
Please refer to your Operator's Manual for the proper testing procedure for your saw's chain brake.

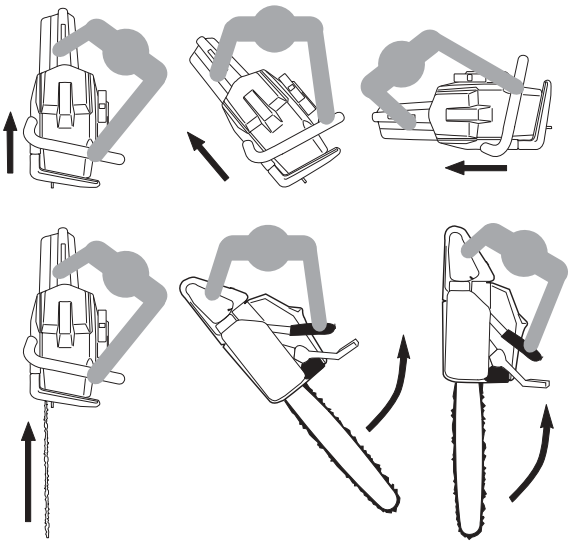
IMPORTANT!

Kickback and its possible consequences can be avoided:

- Use proper working techniques.
- Do not use the kickback danger zone of the bar.
- Avoid unsafe positions.
- Use proper grip.
- Cut at high speed.
- Maintain control over your work piece.
- Be alert.







Pinch Kickback

1. Pinching the saw chain along the top of the guide bar may push the saw back at you.

2. If the bar is pushed back far enough so that the kickback zone hits an object, a rotational kickback may occur.

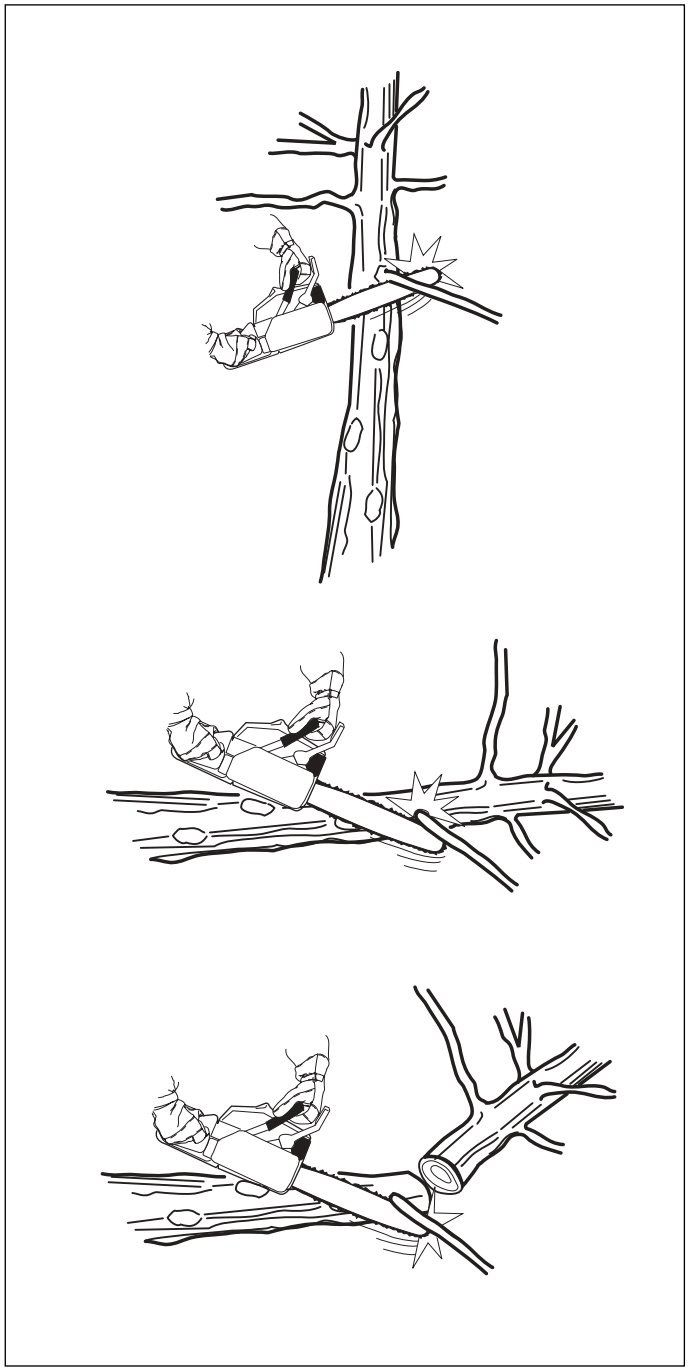
Direction of Kickback

A kickback always travels in the plane of the bar. Depending on how you hold the electric chain saw, a kickback may come up and back at you or move in any angle you happen to hold the electrc chain saw in. For example, if you experience a kickback during felling, the electric chain saw will move in the horizontal plane and can swing around and hit your leg.

IMPORTANT!

- Kickback can only occur if the kickback danger zone of the bar touches an object.
- A kickback can be lightning fast.
- Although most kickbacks are small, a kickback can sometimes be very violent.
- Always be sure of your footing and hold the chain saw firmly with both hands while the motor is running.

General Working Instructions



Avoiding kickbacks

Following the guidelines listed below will help avoid kickbacks:

- Use proper working techniques.
- Do not engage the kickback danger zone.
- Maintain a proper grip.
- Avoid unsafe and off-balance working positions.
- Cut at high chain speed.
- Keep workpiece secure.
- Make sure work area is free of obstructions.
- Stay alert.

Proper working techniques

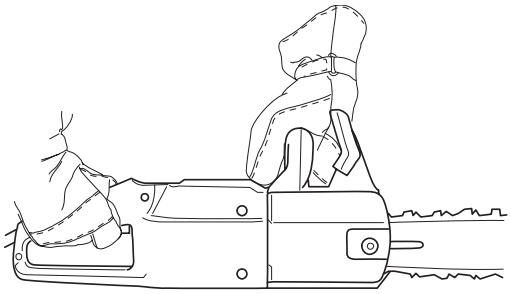
The only way to avoid kickbacks and other common hazards associated with chain saws is by using the proper working techniques.

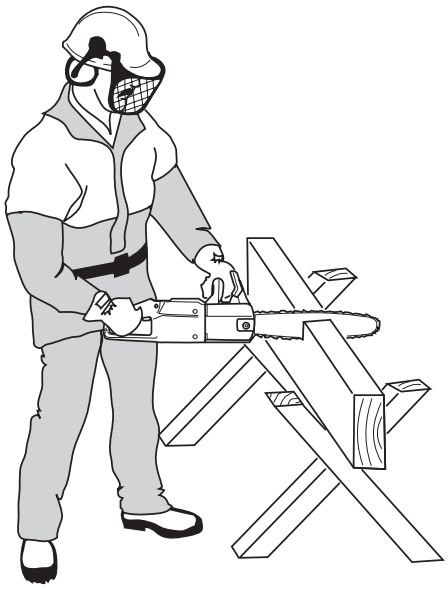
Avoid these situations:

Do not engage the kickback danger zone when cutting. **A kickback can only occur when the kickback danger zone on the tip of the bar is in contact with something, so kickbacks may be avoided entirely by not cutting with that part.**

Ensure that the work area is free from obstructions. Do not let the nose of the guide bar come into contact with logs, branches or other objects which are often in close proximity to the cut.

General Working Instructions





Use Proper Grip

When the motor is running, keep a good, firm grip on the saw, always with both hands. The **right hand** should be on the **rear handle**, and the **left hand** on the **front handle**. All people, whether right or left handed, should use this grip. Use a firm grip with thumbs and fingers encircling the electric chain saw handles.
Never use your saw while holding it with only one hand. A firm grip will help you reduce kickback and maintain control of the saw.

NOTE! If you are left handed:
Your electric chain saw is designed to be held with your right hand on the rear handle and left hand on the front handle. **ALL PEOPLE, WHETHER RIGHT OR LEFT HANDED, SHOULD USE THIS GRIP.**
Using the opposite grip, right hand - front handle, left hand - rear handle, gives you less control of the saw. It also brings the bar and chain closer to your body during normal operation. It is also possible you will not be able to activate the chain brake if your right hand is holding the front handle.

Avoid Unsafe Positions
Do not use your chain saw above shoulder height. The saw is harder to control in these positions, and with the bar closer to your face / upper body, even a small kickback may have enough speed and force to reach you. Also, your chain brake may not have enough time to slow down the chain if the kickback starts from an unsafe position close to your body, even if the brake is activated.

Do not overreach or work from an unsafe position, such as from a ladder, in a tree or in a pile of wood. In such situations, your footing is insecure and you can easily cut yoursef, either through a simple distraction or through a kickback because your control of the saw is insufficient.

Use Proper Speed
Cut at high motor speed. At higher speeds, the saw chain is less likely to become stuck.

Maintain control over workpiece
If the pieces you cut are small and light, the chain can catch and throw them at you. Although not necessarily dangerous in itself, it can startle you and affect your control of the saw. Never cut stacked or piled logs or branches without pulling your workpieces out one by one. Cut only one log or piece at a time. Remove the pieces you have cut to keep your work area clear.

General Working Instructions

Avoiding Kickback - Your Equipment

IMPORTANT!

This equipment is for extra protection. It cannot fully prevent kickbacks - only minimize them. Never rely entirely on these safety devices for your protection. Rely instead on safe working techniques.

As explained previously, kickback can be avoided by using safe cutting techniques, in which you consistently avoid cutting with the tip of the guide bar.
However, certain items on your electric chain saw are also designed to minimize the kickback itself or potential injuries, should a kickback occur.

Low-Kickback Chain
Modern saw chains are designed to reduce the force of a kickback. Your Operator's Manual lists low-kickback saw chains that have been tested and selected for your saw.

⚠ CAUTION!

The chain's kickback reduction features will provide their intended protection only if the chain is sharpened and maintained according to the manufacturer's instructions. As a cutter is filed away when sharpened repeatedly, it gradually becomes increasingly aggressive. Towards the end of its service life, it is more prone to kickback than when it was new.

Your saw chain has been designed to reduce the likelihood of kickback, If the chain is not sharpened according to the manufacturer's directions, some of the chain's kickback-reduction features may deteriorate, making the chain more dangerouse to use. Always follow the chain manufacturer's sharpening instructions.

When it is time to replace your saw chain, replace it with a low-kickback cain. Follow our recommendations in the Operator's Manual or your dealer's advice.
Be sure that you get a chain that offers the same or better protection that the original equipment.

Small Nose Radius Bar
The smaller the bar-nose radius, the smaller the kickback zone and the less likely it is that a severe kickback will occur. Your Technical Manual lists small nose radius bars available for your saw.

IMPORTANT!

To minimize the risk of kickback, you should always:

- Use small nose radius bar and low-kickback saw chain.
- Check and adjust chain tension.
- Maintain cutter sharpness and correct depth gauge height.
- Replace worn or damaged bar and chain with approved replacement combinations.

Basic Working Techniques

IMPORTANT!

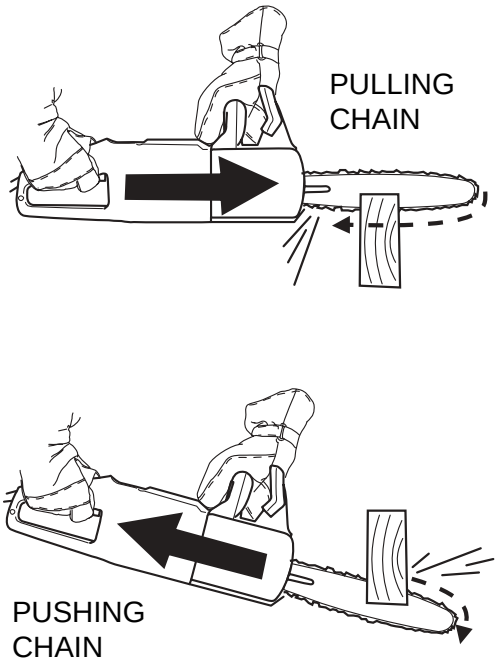
This information does not cover every specific situation. Circumstances may vary depending on the terrain, vegetation, type of wood, form and size of trees, etc. Consult your service dealer, foresty agent or local foresty schools for advice on specific woodcutting problems in your area.

This will make you more efficient and your work safer.

General rules.

1. Avoid cutting under adverse weather conditions, such as dense fog, heavy rain, bitter cold, high winds, etc. Adverse weather is often tiring to work in and creates potentially dangerous conditions such as slippery ground. High winds may force a tree to fall in an unexpected direction causing property damage or personal injury.

REACTIVE FORCES



2. Avoid stumbling on obstacles, such as stumps, roots, rocks, branches and fallen trees.

3. Watch out for holes and ditches.

4. Be extremely cautious when working on slopes or uneven ground.

5. Turn saw off before moving from one place to another.

6. If you are not copmletely sure a cutting situation is safe, or you require assistence, get help before continuing.

Reactive Forces

When you are cutting, the chain in the kerf forces your saw in a direction opposite to the chain movement. This is called a reactive force. One such reactive force previously covered is kickback. With any chain saw, the energy used to cut wood can be reversed and work against the operator. If a rotating chain suddenly jams or hits a solid object, reactive forces occur instantly and may make you lose control of the saw.

1. Be especially alert during limbing operations when it is easier to jam the chain or touch a limb by mistake.

2. Keep your feet firmly planted in a wide, balanced stance.

3. Keep the saw body close to your body to improve control and to reduce strain.

4. When cutting with the bottom chain, the reactive force will pull the saw away from you towards the wood you are cutting. The saw will control the feeding speed and sawdust will be thrown back at you.

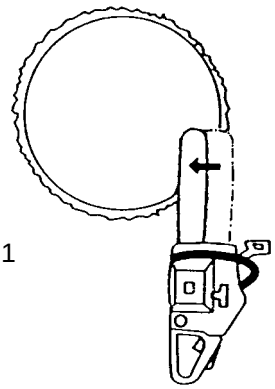
5. When cutting with the top chain, the reactive force will push the saw towards you and away fron the wood you are cutting.

6. Cut with the bottom chain as much as possible.

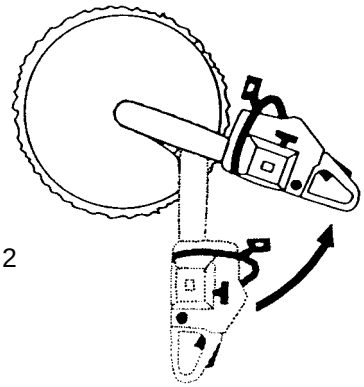
STOP WARNING!

If you are cutting with a pushing chain and allow the saw to be pushed back far enough to engage the tip of the bar, a kickback may occur. See page 17.
Be especially cautious regarding nearby objects when cutting with a pushing chain or «under up».
The kickback zone will move INTO such objects during «under up» cutting, increasing the possibility of kickback.

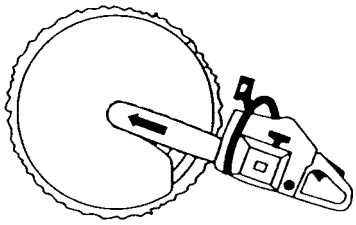
Basic Working Techniques



STEP 1



STEP 2



STEP 3

Boring Cut

A boring cut is used to fell large trees. Follow the steps listed below when performing a boring cut.

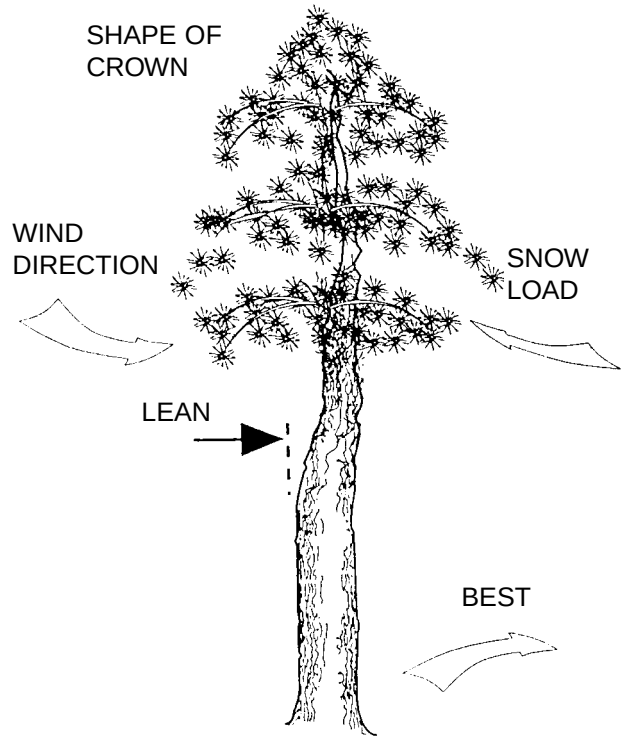
1. Cut, using the bottom portion of the guide bar tip, until the depth of the cut is equal to the width of the guide bar and deep enough to stop a kickback during steps 2 and 3.

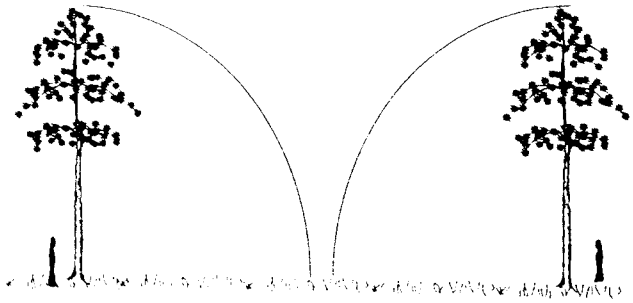
2. Operating at full throttle, align the saw with the direction of cut.

3. With saw at full throttle, press the guide bar straight into the trunk.

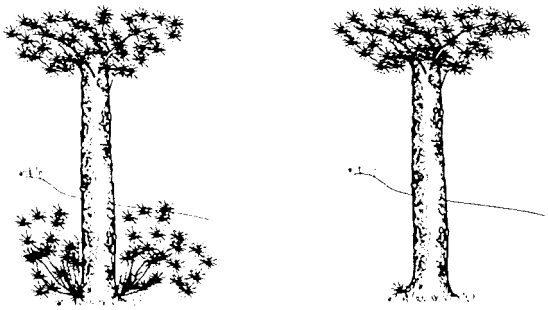
WARNING!

Making a boring cut can be dangerous if improperly performed. Only properly trained operators should attempt this technique.

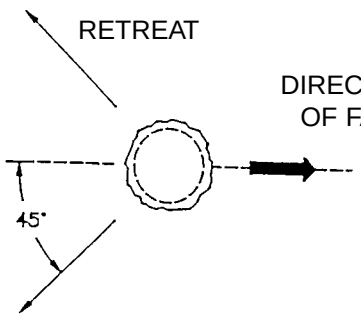




KEEP TWICE THE TREE LENGTH AS DISTANCE



CLEAR AWAY THE UNDERBUSH



Felling

Felling is more than merely cutting down a tree.
You must also decide where you want it to fall and bring it down as close as possible to the intended line of fall without damaging the tree or anything else.

Before Felling

Carefully consider everything which may affect the direction of fall, including:

1. Direction and degree of lean.
2. Shape of crown.
3. Snow load on crown.
4. Wind direction.
5. Obstacles within tree range: e.g. power lines, roads, buildings, other trees, etc.

⚠ CAUTION!

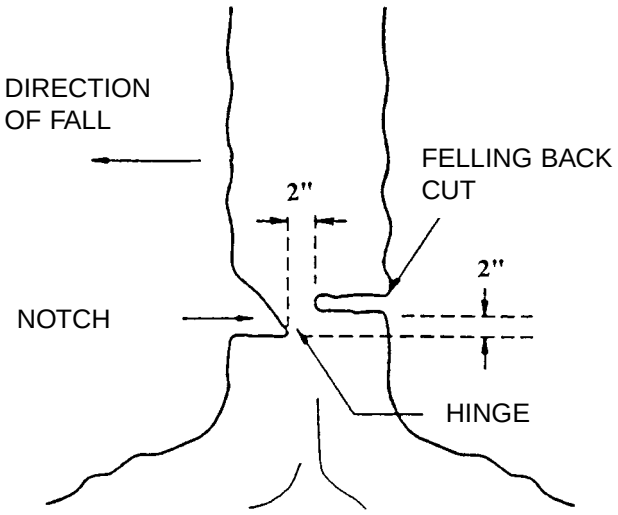
Always observe the general condition of the tree. Look for weakened or rotten sections in the trunk which will make it more likely to give way and start to fall before you expect. Look for dry branches which may break and hit you while you are working.

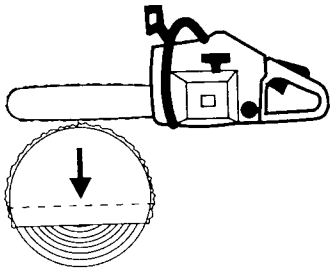
Always keep animals and people at a distance of at least twice the length of the tree while felling.

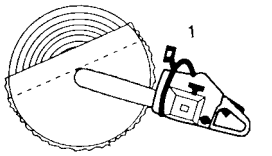
Clear away shrubs and branches around the tree.

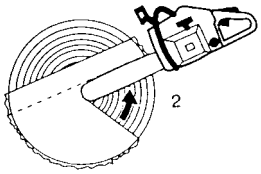
A path of retreat should be planned and cleared if necessary before beginning to cut. The path of retreat should lead diagonally backwards from the intended line of fall, as illustrated in the figure.

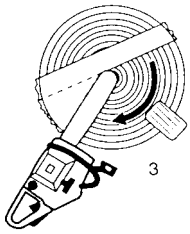
Basic Working Techniques

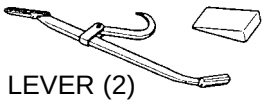




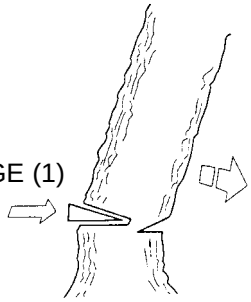








FELLING LEVER (2)



WEDGE (1)

Basic Rules for Felling Trees

Normally, felling consists of two main cutting operations - notching and the felling cut.

Felling Back Cut

Make the felling back cut at least 2 inches (5 cm) higher than the bottom of the notch, as illustrated and keep it parallel to the horizontal bottom of the notch. Make the back cut, leaving enough wood to act as a hinge. The hinge wood keeps the tree from twisting and falling in the wrong direction.
Do not cut through the hinge.

As the felling cut gets close to the hinge, the tree should begin to fall. If there is any chance that the tree may not fall in the right direction, or it may rock back and bind the saw chain, stop cutting before the felling cut is complete and insert wedges of wood, plastic or aluminum to open the cut and drop the tree along the desired line of fall. Ensure that no one is present within the range of the falling tree before you push it over.

When the tree begins to fall, remove the chain saw from the cut, stop the motor, put the chain saw down and move along the path of retreat. Be alert for overhead limbs falling and watch your footing.

Felling Cut - Trunk Diameter Less than Guide Bar Length

Saw with a pulling chain (bottom of guide bar).

Felling Cut - Trunk Diameter Greater than Guide Bar Length

⚠ CAUTION!

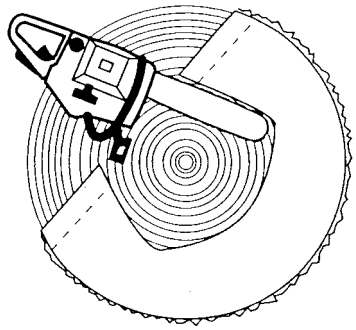
Watch out for kickbacks. Do not use the upper quadrant of the guide bar tip.

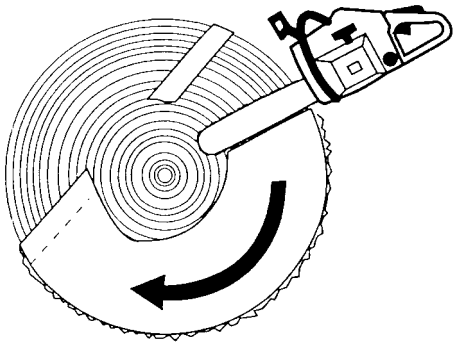
1. Make a bore cut behind and above the notch.

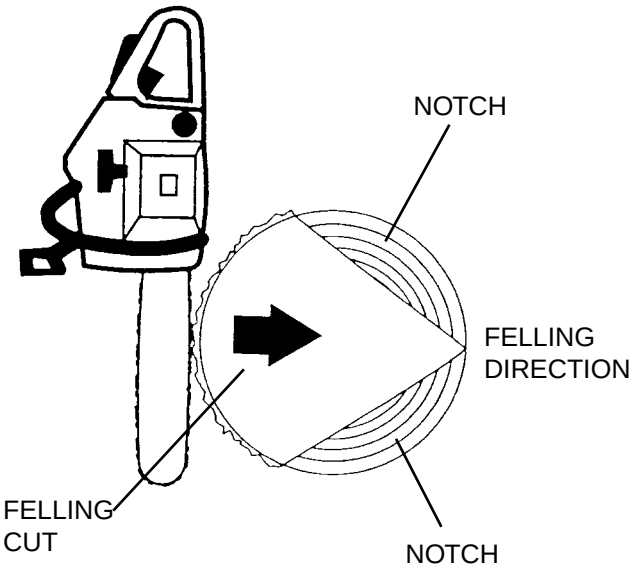
2. Even this cut parallel to notch, using pushing chain. (top side of the bar). Leave sufficient hinge.

3. Continue felling back cut around trunk using pulling chain (underside of guide bar)

- Insert a wedge (1) or felling lever (2) if you have misjudged the line of the fall. Ensure that no one is within the range of the falling tree before you push it over.







Felling Cut - Trunk Diameter More than Twice Guide Bar Length.

1. Cut a large, wide notch.
2. Cut a recess into center of notch.

IMPORTANT!
Always leave a hinge on both sides of center cut.

3. Saw around trunk with a pulling chain to complete felling.

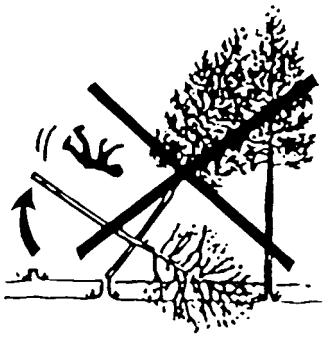
Felling Leaning Trees

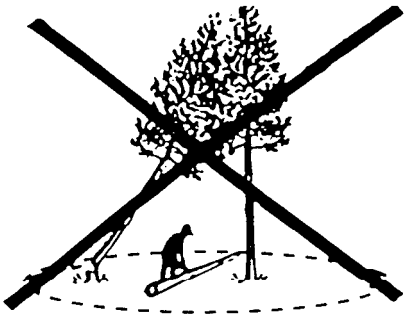
⚠ **CAUTION!**
Excessively leaning trees are under tension and may split easely, causing root end to rise up or be thrown rearwards.

1. Make two notches.The tip formed where the notches meet should point toward the felling direction.
2. Make the felling cut straight from behind, a bit at a time.

This method will slow the fall of the tree and allow you to get clear.

Basic Working Techniques





RIGHT

WRONG

Lodged Trees

WARNING!

A lodged tree is a dangerous situation.
Do not try to fell a tree in which another tree is lodged.

Do not fell another tree onto a lodged tree.

Do not work inside the danger area of a lodged tree and do not allow people inside danger area.

Some Suggestions as to How You can Take Down a Lodged Tree.
If the tree you have felled gets hung up, do nothing hastily. Take a rest and give some thought to the situation in peace and quiet. Consider various alternatives and always choose a safe method even if it takes a little longer.

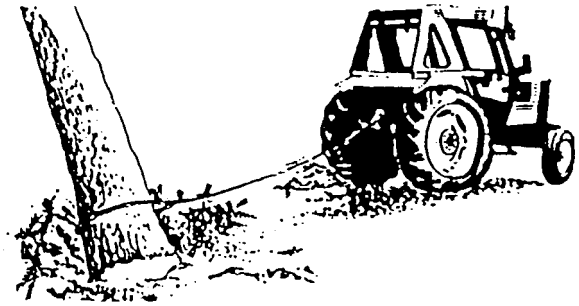
Simple Hang-Ups Rolling the Tree.

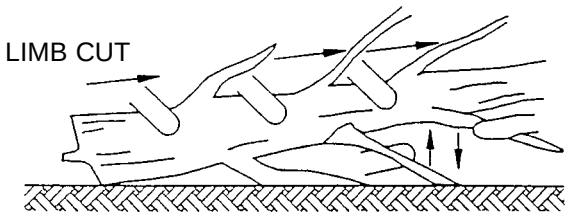
1. Determine direction tree can most easily be rolled down.
2. Cut tree loose from hinge, leaving a little on the side you intend it to roll down on.
3. Using a cant hook or similar tool, roll the tree away from you.
4. Lift with a straight back.

CAUTION!

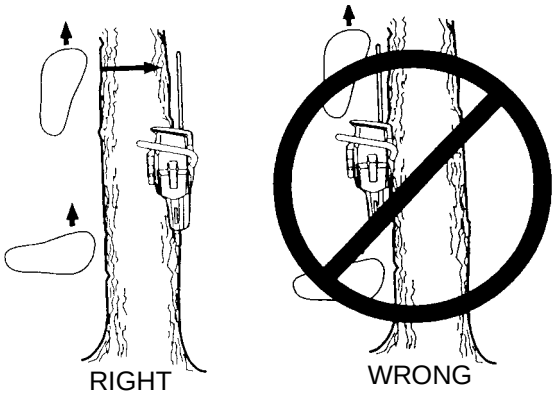
If you are not properly positioned when the tree starts to move, you might get caught by the cant hook or the tree itself.

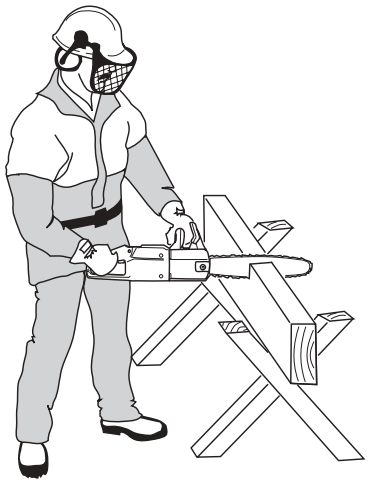
If the tree is wedged in the branches of another tree, you can exert more rolling force using a cant hook and a long pole.
Remember to lift correctly with a straight back.

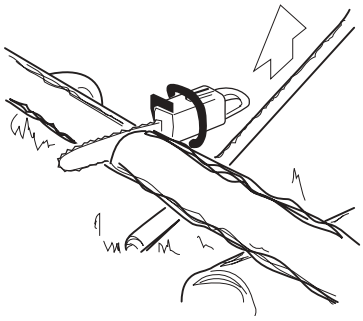




KEEP WORK OFF GROUND
LEAVE SUPPORT LIMBS UNTIL LOG IS CUT







Hang-Ups

Use a portable or tractor-mounted winch to pull the tree down.

⚠ CAUTION!

Do not abandon a leaning, hung or lodged tree. Such trees are a danger to other people and must be taken down. Mark off the area if you have to leave in order to obtain assistance.

Limbing a tree

Limbing consists of removing the branches from a fallen tree.

When limbing, leave larger, lower limbs to support the log off the ground. Remove the small limbs in one cut as illustrated. Branches under tension should be cut from the botom up to avoid jamming the chain saw.

STOP WARNING!

A majority of kickback accidents occur during limbing operations. Do not engage the guide bar's kickback zone. Take great care to avoid contact between the nose of the guide bar and the log, limbs or other objects.

Be extremely cautious of limbs under tension. They can spring back toward you and cause loss of control and injury.

1. Stand on the left side of the trunk.
2. Maintain a secure footing resting the saw on the trunk.
3. Maintain full control by holding saw close to you.

STOP WARNING!

Keep well away from chain.

4. Move only when the trunk is between you and the chain as shown.

⚠ CAUTION!

Watch out for springback from limbs under tension.

Cutting logs or wood.

Support logs on other logs, or wood on a sawhorse or equivalent. Never cut through a piece of wood that is lying on the ground. Contact with sand, stone or soil will blunt cutting edges.

If the saw jams.

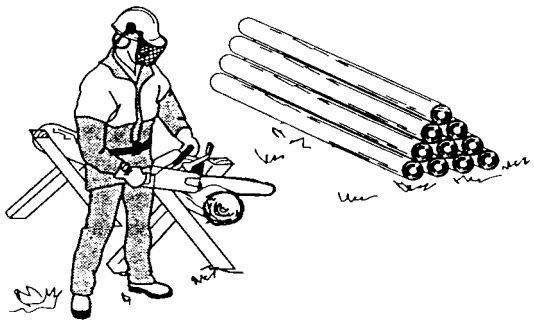
Stop the motor.

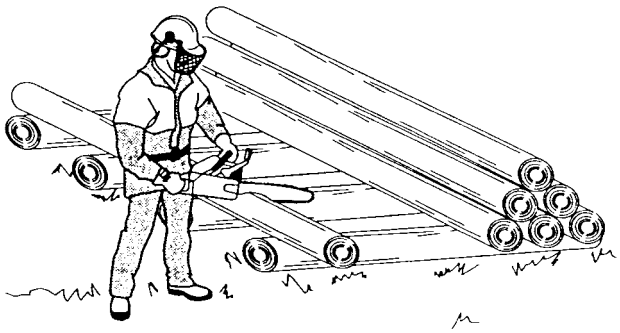
Raise the log or change its position using a thick branch or pole as a lever.

STOP WARNING!

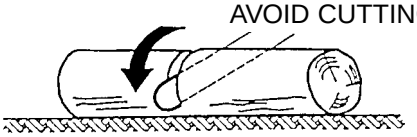
Do not try to pull the saw free. If you do, you can deform the handle or be injured by the saw chain if the saw is suddenly released.

Basic Working Techniques

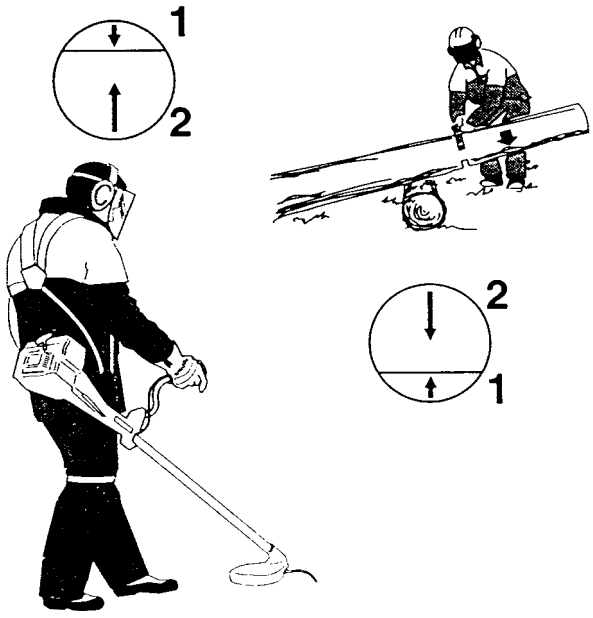




CUT FROM TOP (OVERBUCK)
AVOID CUTTING EARTH



LOG SUPPORTED ALONG THE ENTIRE LENGTH



Cutting Logs

WARNING!

Never attempt to cut two logs lying together or logs which are piled up.
Doing so drastically increases the risk of kickback and serious or fatal injury.

When cutting a pile of logs, remove each log from the pile and place on sawbench or prop up before cutting individually.

Remove the cut pieces from the cutting area. Leaving them scattered around the work area increases the risk of kickback, or of losing your balance while working.

Crosscutting/bucking

Before starting to cut through the log, try to forsee what will happen. Look out for stresses in the log and cut through in such a manner that the guide bar will not jam.

IMPORTANT !

- It is important to make sure your footing is firm and your weight is evenly distributed on both feet.
- Whenever possible, the log should be raised and supported by the use of limbs or chocks.
- Follow these simple direction for easy cutting.

When the log is supported along its entire length, as illustrated, cut from the top (overbuck).

Crosscutting logs, pressure on top

When the log is supported on both ends as illustrated, cut 1/3 of that diameter from the top overbuck. Then make the finished cut by underbucking the lower 2/3 to meet the first cut.

Crosscutting logs, pressure on bottom.

When the log is supported at both ends as illustrated, cut 1/3 of that diameter from the underside (underbuck). Then make the finished cut by overbucking to meet the first cut.

When bucking on a slope, always stand on the uphill side of the log. When making the final cut, in order to maintain control, ease up on cutting pressure near the end of the cut without relaxing your grip on the chain saw. Do not let the chain contact the ground. After completing the cut, wait for the chain to stop before moving the chain saw.
Always stop the motor before moving from tree to tree.

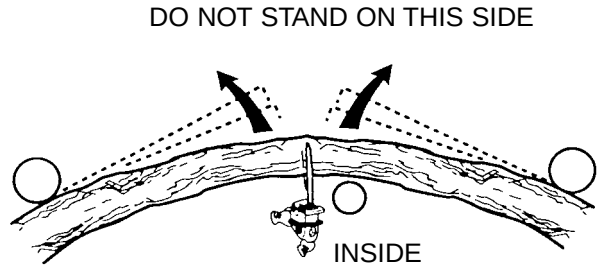
WARNING!

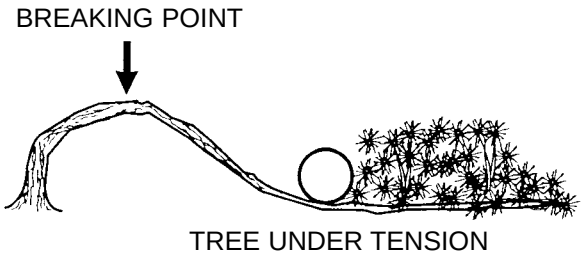
Do not use a chain saw to cut shrubs, brush etc.
The risk of kickback is high and kickbacks can cause fatal injury. If trunks are close, it may be impossible to avoid contact with the kickback zone. Use a brush cutter or other tool designed for the purpose.

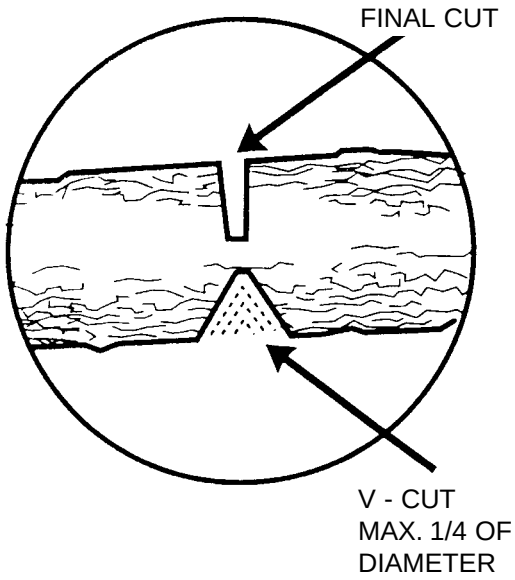
Cutting logs, shrubs, brush, etc.

Do not use your chain saw to cut shrubs, brush etc.
The possibility of kickback is high. If the stands are close together, it might be impossible to avoid contact with the kickback zone.

A brush cutter has been specially designed for small, flimsy objects, and may be used for all types of clearing operations. Your dealer will be happy to show how a brush cutter may be of value to you.







Cutting Trees or Limbs Under Tension.

⚠ CAUTION!

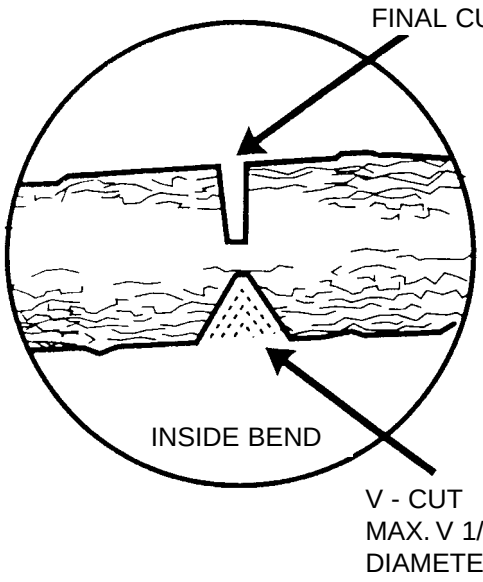
Cutting trees or limbs under tension involves spesial hazards and must be done with care and planning.
If the cut is made improperly, or you are in the wrong position, the tree may spring back at you and cause severe injury

The cut should be made at the tree's breaking point: i.e., the point where the tree would break if it was bent further. That point is normally where the bend is most pronounced. At the breaking point, the forces are mainly trying to push the tree outward. If you are not cutting at the breaking point, the longest section of the stem, besides trying to push outwards, will also try to push along the trunk after it has broken. That makes the forces harder to predict and increases the danger.

STOP WARNING!

Using improper techniques while cutting trees or limbs under tension can be extremely dangerous.
The instructions above cover basic procedures but do not cover all possible situations you may encounter, such as multiple trees entangled in each other, dry wood, etc. Use extreme caution. Improper use may cause severe injury. Do not hesitate to get help if necessary.

Basic Working Techniques



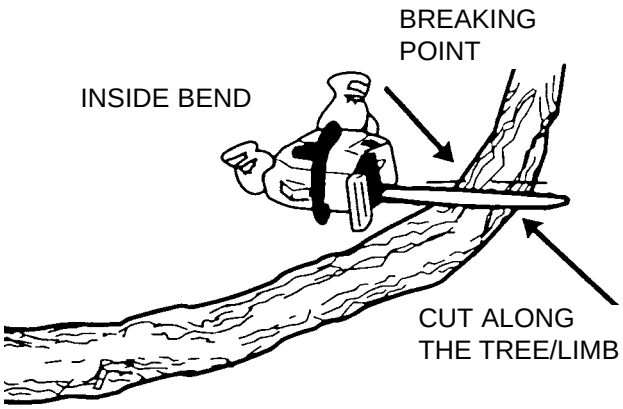
1. Position yourself inside the bend.
2. Start a V-cut on your side, inside the bend. Cut up to 1/4 of the diameter of the trunk, taking care that the saw does not jam.
3. Remaining on the inside of the bend, move the saw over to the opposite side.
4. Cut slowly to reduce tension.

IMPORTANT!

To avoid jamming the saw, a V-cut is recommended for the first cut. Make it in small increments, as illustrated, to permit the tree to break slowly, giving you time to back out of the way.

Small Trees and Limbs Under Tension.

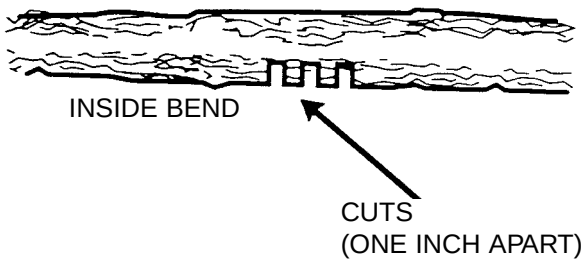
1. Always stay on the inside of the bend.
2. Make your cut at the breaking point.
3. If possible, cut along the tree/limb.
4. Cut slowly to relieve tension.



⚠ CAUTION!

Stay clear of tree/limb path.

5. If you must cut across tree/limb, make two to three cuts, one inch apart one to two inches deep.
6. Continue to cut deeper until tree/limb bends and tension is released.
7. Cut tree/limb from outside the bend, after tension has been released.



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